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The Influence of Cereal-Based and Non-Cereal-Based Flour on the Oils Absorption, Physicochemical and Sensory Characteristics of Chicken Popcorn

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Structured Abstract

Background: Fried foods are popular for their texture and flavor but are often criticized for high oil absorption, contributing to health issues. Alternative flours like oat and chickpea, rich in fiber and protein, may reduce oil absorption while maintaining sensory quality. This study evaluates the effects of various proportions of oat, chickpea, and wheat flours on the oil absorption, physicochemical, and sensory characteristics of chicken popcorn.

Methods: Chicken popcorn made from coating batters that derived from different proportions of wheat, oat, and chickpea flour: CPW100 (100% wheat flour), CPC100 (100% chickpea flour), CPO25 (25:75 oat:chickpea flour), CPO50 (50:50 oat:chickpea flour), CPO75 (75:25 oat:chickpea flour), and CPO100 (100% oat flour). The samples were analyzed in regard to moisture retention and nutritional content such as fat, protein, ash, and carbohydrates. Physical analysis such as batter pickup, frying yield and loss, colour analysis and texture profile analysis and sensory evaluation were also conducted.

Results: Findings reveal that higher proportion of oat flour in the samples increases the oil absorption (fat uptake: 496.34%) but increases the nutritional content such as carbohydrate content (14.28%) while higher composition chickpea flour lowering the oil absorption (fat uptake: 110.46%) while increasing the protein content (24.40%) in the final product. In addition, physical analysis such as batter pickup, frying yield and loss, TPA, and colour analysis were conducted where resulted in the samples with high oat flour resulted in high hardness (2241.33 g) and high chewiness (685.58) while samples with high chickpea flour resulted in high springiness (0.91) and gumminess (991.95). The sensory attributes, including texture, flavor, oiliness and appearance were assessed through 9-point hedonic scale which resulted in CPO25 was the most preferred sample among the panelists.

Conclusion: The combination of chickpea and oat flour, particularly CPO25 and CPO50, effectively minimized oil absorption, improved nutritional content, and retained favorable sensory attributes in chicken popcorn products.

Keywords: Flour, Chicken Popcorn, Fat Uptake, Oat Flour, Oil Absorption

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